D-7917 / LINURON SR ~~UNDATED~~ 11-25-85

DATA EVALUATION RECORD

Releasable

1. Chemical: Linuron

2. Test Material: 94.8% Active Ingredient

3. Study Type: Acute Toxicity Study on a Coldwater Fish Species
   Species Tested: Rainbow Trout
   (Salmo gairdneri)

4. Study ID: Hall, C. (August 1985) 96-Hour LC_{50} (Trout) Linuron. Report 102-85 Prepared by Haskell Laboratory for Toxicology and Industrial Medicine. Newark, DE. Submitted to E.I. du Pont de Nemours & Co., Wilmington, DE. EPA Accession No. 259206.

5. Reviewed by: Elizabeth E. Zucker
   Wildlife Biologist
   EEB/HED
   Signature:
   Date:

6. Approved by: Douglas Urban
   Acting Supervisory Biologist
   EEB/HED
   Signature:
   Date:

7. Conclusions:

This study relating the acute toxicity of technical linuron to rainbow trout may not be used to fulfill a guidelines requirement for a 96-hour LC_{50} test on a coldwater fish species. Test material was insoluble at most of the levels utilized and fish may not have been exposed to nominally designated concentrations. A reliable LC_{50} cannot be derived. Also, fish were smaller than recommended.

8. Recommendations:

N/A

9. Background:

This study was submitted to fulfill guideline requirements developed from the Registration Standard for Linuron.

10. Discussion of Individual Study:

N/A

4 pages

11. Materials and Methods:

a. Test Procedures - Trout were obtained from Trout Lodge, McMillan, Washington and held in the laboratory for 70 days prior to testing. Definitive test specifics of note include:

Fish mean standard length - 3.2 cm.
mean wet weight - 0.38 g
Diluent - laboratory well water
Vessels -glass, rectangular 21 liter aquaria containing 15 liters diluent
Solvent - DMF (0.02 mL/L maximum)
Ten fish per vessel
Fish not fed 48 hours prior to testing
Temperature - 12.0 to 12.5 °C
D.O., pH measured in low, medium, and high concentrations at the beginning and every 48 hours.
Alkalinity - 80 mg/L $CaCO_3$, hardness 69 mg/L $CaCO_3$.
Mortality counts made daily

b. Statistical Analysis - The probit method according to Finney (1971) was utilized to calculate an LC_{50}.

12. Reported Results:

Mortality Data

Conc. (mg/L)	% Dead 24 hrs	48 hrs	72 hrs	96 hrs
2	0	20	90	100
1	0	0	0	40
0.75	0	0	10	20
0.50	0	0	0	10
0.25	0	0	0	0
0.10	0	0	0	0
control	0	0	0	0
solvent	0	0	0	0

D.O. ranged between 8.6 to 9.6 mg/L
pH ranged between 6.9 and 7.3.

A filmy white substance on the surface of the water and a ring on the side of the vessels were observed for concentrations of 0.10 mg/L and greater.

Symptoms of toxicity including lethargy, discoloration, swimming at surface, loss of equilibrium and erratic swimming were noted at levels of 0.5 mg/L and greater.

13. Study Author's Conclusions:

The 96-hour LC_{50} was reported to be 1.0 mg/L (95 percent C.L. of 0.81 mg/L to 1.33 mg/L).

14. Reviewer's Evaluation and Interpretation of the Study:

a. Test Procedures - This study was performed under conditions that generally comply with current testing standards with the following exceptions:

1. Test fish were smaller than recommended.
2. The test material was insoluble in concentrations greater than 0.10 mg/L.

b. Statistical Analysis - Results of Stephan's program are appended

c. Results/Discussion - The test material was insoluble at all levels except the lowest. Fish were not exposed to nominally designated concentrations, thus the LC_{50} cannot be considered reliable.

d. Adequacy of Study:

1. Classification: Invalid

2. Rationale: Test material was insoluble at most concentrations. A reliable LC_{50} cannot be derived from nominally designated dosage levels. Also, fish were smaller than recommended.

3. Repairability: The registrant would have to determine actual exposure concentrations.

ZUCKER LINURON 96 HOUR LC50 LINURON RAINBOW TROUT

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CONC.	NUMBER EXPOSED	NUMBER DEAD	PERCENT DEAD	BINOMIAL PROB.(PERCENT)
2	10	10	100	.0976563
1	10	4	40	37.6953
.75	10	2	20	5.46875
.5	10	1	10	1.07422
.25	10	0	0	.0976563
.1	10	0	0	.0976563

THE BINOMIAL TEST SHOWS THAT .5 AND 2 CAN BE
USED AS STATISTICALLY SOUND CONSERVATIVE 95 PERCENT
CONFIDENCE LIMITS, BECAUSE THE ACTUAL CONFIDENCE LEVEL
ASSOCIATED WITH THESE LIMITS IS GREATER THAN 95 PERCENT.

AN APPROXIMATE LC50 FOR THIS SET OF DATA IS 1.09187

RESULTS CALCULATED USING THE MOVING AVERAGE METHOD

SPAN	G	LC50	95 PERCENT CONFIDENCE LIMITS	
2	.214883	1.06111	.838816	1.31178

RESULTS CALCULATED USING THE PROBIT METHOD

ITERATIONS	G	H	GOODNESS OF FIT PROBABILITY
7	.270867	1	.788959

SLOPE = 5.6849
95 PERCENT CONFIDENCE LIMITS = 2.7262 AND 8.64361

LC50 = 1.00133
95 PERCENT CONFIDENCE LIMITS = .813696 AND 1.32768

LC10 = .59866
95 PERCENT CONFIDENCE LIMITS = .352102 AND .748355

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